

# Fiber to the Home Technology: The beginning of A New Era

<sup>1</sup>Sahib Singh, <sup>2</sup>Dr. Kulwinder Singh & <sup>3</sup>Himat Singh

<sup>1</sup>Asstt. Prof, Guru Arjan Dev Khalsa College, Chohla Sahib, Tarn Taran, Punjab (India)

<sup>2</sup>Guru Arjan Dev Khalsa College, Chohla Sahib, Tarn Taran, Punjab (India)

<sup>3</sup>Asstt. Prof, Guru Arjan Dev Khalsa College, Chohla Sahib, Tarn Taran, Punjab (India)

## ARTICLE DETAILS

### Article History

Published Online: 07 September 2018

### Keywords

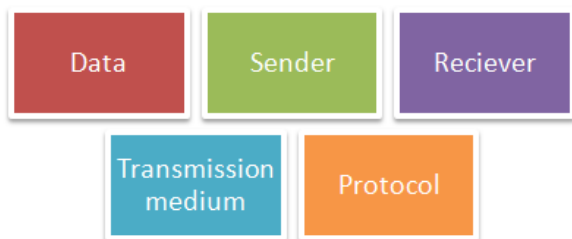
Communication, Protocol, Transmission medium, Remote Services

## ABSTRACT

This Paper has been prepared to help understand the advanced concepts related to Data Communication. Today is the era of fast communication devices. Not even most of devices but every human being is connected with the communication system either using mobiles or ATM or any other electronic gadgets. Communication system is playing vital role in everyone life.

In the past era there was talk of communication system running at the speed of Kilobytes, but as the time goes on, communication system have also proved miracle having the speed of Megabytes and Gigabytes, which brought new revolution in the world. Here in this paper we will concentrate on FTTH technology.

## 1. Components of Communication System



### a. Data:

Communication of data means a message or data will be transmitted from one device and will be received in the destination or target device. Thus the first component in a data communications system is data or message to deliver and receive. Data or message can be of various forms such as text, audio, video, image or combinations of these forms etc.

### b. Sender:

The device that sends the data to the destination or target is the Sender. It can be a computer, cell phone, video camera and so on.

### c. Receiver:

The device that receives the data that was sent by the Sender is the Receiver. A receiver can again be a computer, cell phone, video camera and so on.

### d. Transmission medium:

The transmission medium is the physical path for the data to travel to its destination after being sent by the Sender. Receiver receives the data at one end of this path and the sender sent from another end of the path. Transmission medium could be like twisted-pair cable, coaxial cable, fiber-optic cable etc.

### e. Protocol:

A protocol is nothing but a set of rules that applies on the full data communication procedure. This is like an agreement between the two devices to successfully communicate with each other. For example, how the data will be sent, how the data will be traveling, how to ensure that full data has received, how to handle errors in transmission etc. Both devices follow the same set of rules or protocol so that they understand each other. [1]

## 2. Communication Media

There was number communication media that exist for a long time and carried million Petabytes of data over a number of years, these technologies were.

- Wire pairs
- Coaxial cable
- Microwave transmission
- Communication satellites

But here in this paper we will not discuss the above conventional technologies; here we will discuss the advance communication technology FTTH.

## 3. Fiber to the home technology

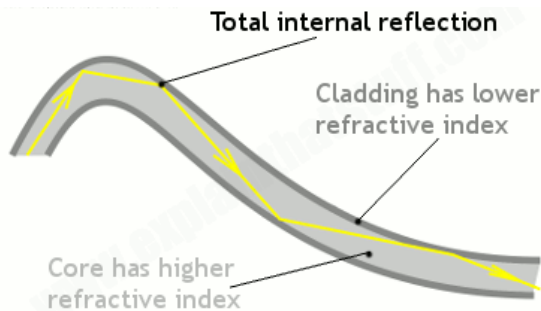
**Fiber to the home (FTTH)** is the delivery of a communications signal over optical fiber from the operator's switching equipment all the way to a home or business, thereby replacing existing copper infrastructure such as telephone wires and coaxial cable. Fiber to the home is a relatively new and fast growing method of providing vastly higher bandwidth to consumers and businesses, and thereby enabling more robust video, internet and voice services.

Fiber is a much better and faster way to get broadband, and has the speed and reliability of cable Internet service. However a fiber connection is more expensive than a standard DSL connection. Fiber to the home technology is used to delivery communications signal over optical fiber from the operator's switching equipment to a business or home, thereby

replacing copper cables such as telephone wires and coaxial cable.

#### 4. How fiber-optics works

Light travels down a fiber-optic cable by bouncing repeatedly off the walls. Each tiny **photon** (particle of light) bounces down the pipe like a bobsleigh going down an ice run. Now you might expect a beam of light, traveling in a clear glass pipe, simply to leak out of the edges. But if light hits glass at a really shallow angle (less than 42 degrees), it reflects back in again—as though the glass were really a mirror. This phenomenon is called total internal reflection. It's one of the things that keep light inside the pipe.



*Fiber Optic cable working [4]*

#### 5. Benefits of FTTH

- **Less attenuation:** (signal loss) Information travels roughly 10 times further before it needs amplifying—which makes fiber networks simpler and cheaper to operate and maintain.
- **No interference:** Unlike with copper cables, there's no "crosstalk" (electromagnetic interference) between optical fibers, so they transmit information more reliably with better signal quality
- **Higher bandwidth:** As we've already seen, fiber-optic cables can carry far more data than copper cables of the same diameter.[4]

#### 6. The services over FTTH

- **Smart Home:** With the help of FTTH, the new devices will enable people to control and monitor "every aspect" of their homes, including temperature, lighting, electrical appliances, gas and water leakage, motion detection, and opening and closing of doors and windows. The smart devices will also enable remotely caring for babies and elderly.[7]
- **TV over IP Service: Internet Protocol television (IPTV)** is the delivery of television content over Internet Protocol (IP) networks. This is in contrast

to delivery through traditional terrestrial, satellite, and cable television formats. Unlike downloaded media, IPTV offers the ability to stream the source media continuously. As a result, a client media player can begin playing the content (such as a TV channel) almost immediately. This is known as streaming media.

- **Video on Demand :** **Video on demand** is a programming system which allows users to select and watch/listen to video or audio content such as movies and TV shows whenever they choose, rather than at a scheduled broadcast time, the method that prevailed with over-the-air programming during the 20th century. IPTV technology is commonly used to bring VOD to televisions and personal computers.
- **Bandwidth on Demand:** Bandwidth on demand can reduce the cost associated with a network. It also helps a network to accommodate additional traffic demands. There is no need to overbuy bandwidth to meet usage spikes. Bandwidth on demand helps many enterprises in addressing network events such as conference calls, video conference calls, live video streaming and other similar data-consuming events[5]
- **Remote Education:** Using FTTH technology, experts can provide the education to remote areas and the students can get updated knowledge of professionals working in the fields. Using FTTH, you can usually set your own pace of study.
- **Point to Point and Point to Multi Point Video Conferencing, virtual classroom**  
With the 100 Mbps speed, it will be possible to interact with each other face to face using video conferencing, either to one person or to joining multiple persons. FTTH technology will reduce the travel cost incurred in traveling for meeting by officers from one country to another or from one state to another.
- **Interactive Gaming:** Interactive gaming means the conduct of games through the use of communications technology that allows a person, utilizing money, checks, electronic checks, electronic transfers of money, credit cards, debit cards or any other instrumentality, to transmit to a computer information to assist in the placing of a bet and corresponding information related to the display of the game, game outcomes or other similar information.[6]

#### References

1. <https://www.onlineclassnotes.com/2017/09/what-are-five-components-of-data-communications-system.html>
2. <https://www.quora.com/What-is-FTTH-technology>
3. [http://www.bsnl.co.in/services/broadband/ftth\\_overview.html](http://www.bsnl.co.in/services/broadband/ftth_overview.html)
4. <https://www.explainthatstuff.com/fiberoptics.html>
5. <https://www.techopedia.com/definition/11129/bandwidth-on-demand-bond>
6. <https://definitions.uslegal.com/i/interactive-gaming/>
7. <https://gadgets.ndtv.com/internet/news/reliance-jio-smart-home-accessories-suite-launched-jio-gigafiber-1878299>